Trigonia and Terebratula are still in existence, which *fed* the fishes of the Oolitic era. From the locality from whence the present specimens were obtained I should not conceive they are sought after by the Port Jackson Shark in such shallow water, and am not aware (other than the fact that they are discovered in a fossil state in the same localities) that they are, or were, consumed as food by the fish now under consideration. They have a curious kind of internal skeleton, as it may be termed, consisting of a flattened calcareous loop, with other pieces diverging from it, which are considered to be supports to the animal's body. There are sixteen recent, and numerous fossil species.

The oldest fossil Mammalia are in the Oolite, also forming peculiar genera, belonging to the insectivorous Marsupialia, such as live now in Australia only.

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ART. V.—*On a New Mineral from M'Ivor.* By R. BROUGH SMYTH, Esq., C.E., F.G.S.

[Read before the Institute, 4th March, 1857.]

THE mineral described in the following analysis was forwarded to me by Philip Chauncey, Esq., District Surveyor, Heathcote. It occurs commonly in the quartz veins in small quantities, and is believed by the diggers to be *Molybdenum.* As my duties at present prevent my Mineralogical studies, I handed the specimens to George Ulrich, Esq., who has prepared the analysis which I now submit to the members of the Philosophical Institute.*

"The mineral is of a steel-grey colour, with metallic lustre, opaque, brittle; the fracture is conchoidal; the streak-powder dark-grey, or black; hardness 2·5—3; spec. grav. (?)

"Before the blowpipe, on charcoal, this ore smelts very easily to a metallic globule, with a sort of boiling motion, emitting at the same time dense white fumes, with a weak smell of sulphurous acid. Close to the mineral the charcoal bears a deep yellow crust, which gradually changes into white; then comes a small uncoloured ring, and again a small blueish

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* Mr. Ulrich was not aware of my intention to publish these results until after his analysis was published, or his examination would have been more complete.—R. B. S..., 11th July, 1857.

white crust. This latter fume can be driven away by the reducing flame, turning greenish blue; the yellow crust disappears with an azure blue shine.

"According to these tests the mineral ought to contain *sulphur, antimony,* and *lead.* To make, however, more certain of it, the powdered mineral was mixed with soda, and again brought on charcoal before the reducing flame. The results were fine lead-like globules, with a yellow fume close to them, and a thin bluish-white one further off. As the metallic globules appeared rather brittle, they were fused together, and (to take up the lead) brought into contact with a small portion of boracic acid: the reducing flame produced herewith red pearls of metallic *copper,* clearly distinguishable on the edge of the slag.

"The phosphorsalt bead received from the mineral a fine emerald-green colour, identifying the presence of *copper.*

"In the open test-tube the heated mineral smelts very easily, causing a white, not fusible, sublimate not far up the tube, and emitting strong fumes of sulphurous acid, which redden blue litmus paper put in at the unheated end of the tube. In the half closed tube the mineral smelts, and sublimates rings of greyish white and white colour; no smell of sulphurous acid perceptible. This latter trial in the tube leaves now some doubt of the presence of antimony, or at least of such a portion of it as to bear an essential part in the chemical composition of the ore as a sulphide. To come to a certain result, however, the ore was brought together with a small piece of iron-wire in a cylindrical hole on the charcoal, and a mixture of borax and soda, in proportion of 1-2, was added as a covering, and the whole mass covered for a while with a good reducing flame. The regulus of lead with antimony (the sulphur having formed a slag with the iron) was taken out of the slag, and, on another piece of charcoal, brought into contact with boracic acid. The reducing flame produced in this way again small reguli of copper, surrounded only by a very thin white fume,—doubtless oxide of antimony.

"By way of these tests, and according to Plattner's experiments, the ore is *cuproplumbit,* $\dot{P}b^2 + \dot{C}u.$, with a small quantity of antimony, or it is a sort of *Bournonite;* the components of which are commonly given quite in another way.

"The qualitative analysis gave the following results:—

"The finely powdered ore dissolved in nitric acid, with a blueish green colour, leaving a heavy white residue and particles of yellow sulphur suspended in the solution. After

filtering, the residue (freed of the flocky sulphur) proved to be sulph. lead, with a trace of antimony. Here the fact was to be observed, that after the chief part of the solution had passed through the filter, and water was poured on it for washing the residue, the fluid received a milky appearance. As this is a proof of the presence of either antimony or bismuth, the white milky precipitate was filtered, and brought together with tartaric acid, it dissolved very easily, and gave thus a doubtless proof of the absence of bismuth, and the presence of antimony.

"The filtered fluid was now acted upon by sulphohydric acid; a black precipitate resulted, which, after careful washing, was brought together with sulphodydride of ammonia, and heated. As no perceptible change in colour or quantity of the precipitate took place, the fluid was, however, filtered, and chlorohydric acid added to it, the forthcoming greyish orange-coloured precipitate (still in very small quantity) proved now the presence of antimony without a doubt. The black precipitate, dissolved in nitric acid, to a green solution (*Cu.*), by parting with flocky sulphur. Sulphuric acid caused now a white heavy precipitate of sulphate of lead; and ammonia in excess, added to the liquor (filtered from sulphate of lead) imparted a light blue colour—no precipitate—testing so the presence of copper, however small in quantity, and the absence of bismuth and cadmium.

"The fluid, filtered from the black precipitate, caused by sulphuretted hydrogen, was mixed with ammonia, and chloride of ammonia, till it rendered red litmus paper blue, and then sulphohydride of ammonia added and no precipitate appearing proved the absence of iron, nickel, and cobalt.

"The final result of this qualitative anaylsis can now be stated as follows:—

"Lead and sulphur form the predominant components; copper and antimony are present in small quantities.

"As the specimen of the ore was very small, and much impregnated with quartz, a larger and purer piece, perhaps with crystals or cleavage observable, would be very satisfactory, and enable one to make an exact quantitative analysis to establish the fact of its being a new mineral, which most of the results of the above recorded experiments tend to.

"It need not be added that a trace of silver is not excluded by this analysis, and could in a purer piece be easily found by smelting, and afterwards cupellating with a portion of test lead. Most of these minerals contain a trace of silver."